SINE BARS, BLOCKS, PLATES, AND FIXTURES

COMMERCIAL STANDARD CS141-47

Effective Date for New Production From August 15, 1947

A RECORDED VOLUNTARY STANDARD
OF THE TRADE

UNITED STATES DEPARTMENT OF COMMERCE
W. AVERELL HARRIMAN, Secretary

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COMMERCIAL STANDARDS

Commercial Standards are voluntary standards of the trade developed through concerted action of those directly concerned, and issued by the United States Department of Commerce upon written evidence of their acceptability to the trade. They are initiated by written request from a responsible element of business to the Division of Trade Standards of the National Bureau of Standards. The Division of Trade Standards acts as a coordinating and fact-finding agency in ascertaining the desires of all concerned.

The Federal Government exercises no regulatory authority in the enforcement of Commercial Standards. In accepting a Commercial Standard, the producer, distributor, or user says in effect that he considers it a useful standard of practice, and plans to utilize it as far as practicable in his business, reserving the right to depart from the standard so long as no deception results from such departure. When reference to a Commercial Standard is made in contracts, labels, invoices, or advertising literature, however, the provisions of the standard are enforcible through usual legal channels as a part of the sales contract.

Organized in 1927, the Division of Trade Standards has assisted many industries in the development of Commercial Standards for a wide variety of commodities. A list of previously established Commercial Standards appears herein.

COMMERCIAL STANDARD FOR SINE BARS, BLOCKS, PLATES, AND FIXTURES

On August 10, 1945, at the instance of the War Production Board, a proposed Commercial Standard for Sine Bars, Blocks, Plates, and Fixtures was circulated to leading representatives of the trade for comment. A draft adjusted in line with that comment was made available to the War Production Board.

Following surrender of the Axis powers, and upon recommendation of leading manufacturers and users, the adjusted draft was circulated to interested producers, distributors, testing laboratories, and users for written acceptance on January 28, 1946. The trade has since accepted and approved the standard as shown herein.

Project Manager: F. E. POWELL, assisted by P. S. MURPHY, Division of Trade Standards, National Bureau of Standards.

Technical Advisers: D. R. MILLER and C. E. HAVEN, Division of Metrology, National Bureau of Standards.

SINE BARS, BLOCKS, PLATES, AND FIXTURES

COMMERCIAL STANDARD CS141–47

PURPOSE

1. The purpose of this commercial standard is to provide minimum essential requirements for sine bars, blocks, plates, and fixtures described herein, as a basis for better understanding between sellers and buyers, for fair competition, and for identification of sine bars, blocks, plates, and fixtures conforming thereto.

SCOPE

2. This standard covers the major essential requirements for sine bars, sine blocks and sine plates, sine bar fixtures and sine plate fixtures, in the following classifications and with particular reference to the following sizes:

(a) Sine bars, commercial and laboratory classifications, in sizes 5 in., 10 in., and 20 in.

(b) Sine blocks and sine plates, commercial and laboratory classifications in sizes 5 in., 10 in., and 20 in.

(c) Sine bar fixtures and sine plate fixtures, commercial and laboratory classifications, in sizes 5 in., 10 in., and 20 in.

DEFINITIONS

3. *Sine bar.*—For purposes of this standard, a sine bar consists essentially of a bar serving as a straightedge and two cylindrical buttons mounted thereon with their axes parallel and at a specified distance apart, and with the line of the button centers accurately parallel to the upper face (and lower face, if a reference surface) of the bar. Sine bars permit accurate measurement and layout of angular relationships through use of the sine function. In determining a specific angle, the known distance between button axes becomes the hypotenuse of a right triangle, and the height of leg opposite the angle being determined, is measured by gage blocks or similar accurate means.

4. *Sine block, sine plate.*—For purposes of this standard, a sine block or sine plate consists essentially of a block or plate providing reference surfaces, with two cylinders attached to the block or plate and so disposed as to provide for measurement of angles in the same manner as with a sine bar. Facilities for attachment of accessories or work pieces to the several surfaces of the block or plate, or short extensions (heels) constituting the legs of a right angle iron or both, are customarily provided.

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5. *Sine bar fixture.*—For purposes of this standard, a sine bar fixture consists essentially of a sine bar, a flat surfaced base, and means for adjusting and holding the sine bar in accurate relation to the surface of the base.

6. *Sine plate fixture.*—For purposes of this standard, a sine plate fixture consists essentially of a sine block or plate and a base with the reference areas of its upper and lower surfaces plane and parallel. The plate is usually hinged to the base at one end. Sine plate fixtures may be of the compound type with provision for angular adjustment in two planes.

GENERAL REQUIREMENTS

7. *Material.*

7a. *Tool steel.*—For purposes of this standard, tool steel means a high quality electric furnace alloy steel, alloy case hardening steel, alloy tool steel, carbon tool steel, or steel of composition corresponding to SAE No. 1020 suitably case hardened, free from all imperfections which might mar the finished surface of the product.

7b. *Cast iron.*—For purposes of this standard, cast iron shall be a suitable grade of fine-grained grey iron, free from inclusions, sand holes, and porosity that might in any way affect the finish, accuracy, or usefulness of the tool.

8. *Seasoning (dimensional stabilizing).*—For purposes of this standard, to minimize dimensional changes after finishing, dimensional stabilizing shall include an appropriate treatment for the aging of cast iron and tool steel.

9. *Finish.*—All sharp edges and corners shall be removed. For purposes of this standard, requirements of the following designations for surface finish apply:

9a. *Scraped.*—A scraped surface shall be hand-scraped so that the surface defined by the bearing areas will not vary from a true plane by an amount greater than the applicable flatness tolerance herein specified. The number of bearing areas or of scraped relief spots (in lapped or ground surfaces) shall be not less than 15 per square inch. Bearing area shall be uniformly distributed and shall be not less than 20 percent nor more than 40 percent of the area of the surface, except that on high-precision surfaces for special requirements and having more than 15 bearing areas per square inch, a greater percentage of bearing area may be allowed.

9b. *Ground.*—All surfaces having a ground finish, shall be smooth, and free from objectionable defects such as chatter, tool marks, irregular wheel marks, burning, cracks, or scratches.

9c. *Lapped.*—A lapped surface shall be finished to give a uniformly flat or cylindrical surface, smooth and free from all traces of machining or grinding, and shall show no evidence of objectionable scratching.

DETAIL REQUIREMENTS

SINE BARS

10. *Types.*—Sine bars are manufactured in two types, side button and base button, corresponding to the positioning of the buttons on the side of the bar or on the under surface of the bar.

11. *Sizes.*—Specific sizes of sine bars covered by this standard are 5 in., 10 in., and 20 in., center to center of buttons, as shown in tables 1 and 2. (See par. 16.)

12. *Classifications.*—Sine bars are provided in (1) commercial and (2) laboratory classifications.

12a. *Commercial.*—For the purpose of this standard, commercial class sine bars are those conforming to the tolerances shown in table 1.

12b. *Laboratory.*—For the purpose of this standard, laboratory class sine bars are those conforming to the tolerances shown in table 2.

13. *Construction.*—The buttons attached to the side or to the under surface of the bar shall be ground and lapped to the same size. The side faces of the bar shall be ground square with the working face or faces which may be ground or ground and lapped as specified.

14. *Material.*—Sine bars shall be tool steel, hardened, drawn and seasoned. (See par. 7a.)

15. *Hardness.*—Sine bar buttons shall have a Rockwell hardness of C62–66 or equivalent surface hardness, and the bar shall have a Rockwell hardness of C60–65 or equivalent surface hardness.

16. *Accuracy.*—A sine bar shall conform in all respects to the accuracy requirements of its classification and size, tables 1 and 2. (For sizes smaller than 5 in., tolerances for the 5-in. size of the designated class shall apply. For sizes above 5 in.—other than 10 in. and 20 in.—applicable tolerances shall be obtained by straight-line interpolation between the values in tables 1 and 2 or by extrapolation on the straight lines determined by the 10-in. and 20-in. values in tables 1 and 2.

16a. *Bar tolerances.*—Errors in flatness of the working face or faces of the bar, in squareness of working face to sides of bar, and in parallelism of working faces (if double, that is, if upper and lower working faces are provided) shall not exceed the tolerances specified in column 2 of tables 1 and 2 for commercial and laboratory classifications, respectively. Specified tolerances apply to all areas to within $\frac{1}{32}$ in. from the edge of the finished surfaces.

16b. *Diameter of buttons.*—On any bar, the difference between the average diameter of one button and the average diameter of the other button shall be within the applicable tolerance specified in column 3 of table 1 or 2.

TABLE 1.—*Tolerances for sine bars, blocks, and plates—commercial class*

1	2	3	4	5
Size	Bar	Buttons or cylinders		
	Working surface to be flat, square with sides and parallel (if double) within—	Cylinders to be alike, round and straight, within—	Cylinders to be parallel with each other and with working surface of bar within—	Cylinders to be at nominal center distance (±)—
in.	*in.*	*in.*	*in.*	*in.*
5	0.000 10	0.000 05	0.000 10	0.000 2
10	.000 15	.000 05	.000 15	.000 3
20	.000 20	.000 06	.000 20	.000 4

TABLE 2.—*Tolerances for sine bars, blocks, and plates—laboratory class*

1	2	3	4	5
Size	Bar	Buttons or cylinders		
	Working surface to be flat, square with sides and parallel (if double) within—	Cylinders to be alike, round and straight, within—	Cylinders to be parallel with each other and with working surface of bar within—	Cylinders to be at nominal center distance (±)—
in.	*in.*	*in.*	*in.*	*in.*
5	0.000 050	0.000 03	0.000 050	0.000 10
10	.000 075	.000 03	.000 075	.000 15
20	.000 100	.000 04	.000 100	.000 20

16c. *Roundness and taper of buttons.*—Total variation in diameter (out-or-roundness and/or taper) for each button shall be within the applicable tolerance specified in column 3 of table 1 or 2.

16d. *Alinement of button axes.*—Errors in parallelism of button axes, in the length of the buttons, shall not exceed the applicable tolerance specified in column 4, table 1 or 2. Button axes shall be parallel to the working surface of the bar within the applicable tolerance specified in column 4, table 1 or 2. On any bar, the two button axes shall be the same distance from the working surface of the bar within the applicable tolerance specified in column 4, table 1 or 2.

16e. *Spacing of button axes.*—On any bar, errors in spacing of button axes shall not exceed the applicable tolerance specified in column 5 of table 1 or 2.

SINE BLOCKS AND SINE PLATES

17. *Sizes.*—Specific sizes of sine blocks and sine plates covered by this standard are 5 in., 10 in., and 20 in., center to center of cylinders as shown in table 1 and 2. (See par. 22.)

18. *Classifications.*—Sine blocks and sine plates are provided in (1) commercial and (2) laboratory classifications.

18a. *Commercial.*—For the purpose of this standard, commercial class sine blocks and sine plates are those conforming to the tolerances shown in table 1.

18b. *Laboratory.*—For the purpose of this standard, laboratory class sine blocks and sine plates are those conforming to the tolerances shown in table 2.

19. *Construction.*—Cylinders shall be ground and lapped to the same size. The side faces of the block or plate shall be ground square with the working face or faces which may be ground or ground and lapped as specified.

20. *Material.*—Sine blocks and sine plates shall be tool steel, hardened, drawn and seasoned. (See par. 7a.)

21. *Hardness.*—Sine block and sine plate cylinders shall have a Rockwell hardness of C62–66 or equivalent surface hardness, and the block or plate shall have a Rockwell hardness of C60–65 or equivalent surface hardness.

22. *Accuracy.*—Accuracy requirements for sine blocks and sine plates shall be interpreted as in the case of sine bars (par. 16). Tolerances shall not exceed the applicable values shown in tables 1 and 2, except that where actual width of working surface is greater than the nominal size of the block or plate, maximum flatness tolerance along the width dimension is obtained by interpolation as set forth in paragraph 16, actual width of working surface being substituted for nominal size.

SINE BAR FIXTURES AND SINE PLATE FIXTURES

23. *Sizes.*—Specific sizes of sine bar and sine plate fixtures covered by this standard are 5 in., 10., and 20 in., center to center of cylinders, as shown in tables 1 and 2. (See par. 28a.)

24. *Classifications.*—Sine bar and sine plate fixtures are provided in (1) commercial and (2) laboratory classifications.

24a. *Commercial.*—For the purpose of this standard, commercial class sine bar and sine plate fixtures are those conforming to applicable tolerances shown in table 1.

24b. *Laboratory.*—For the purpose of this standard, laboratory class sine bar and sine plate fixtures are those conforming to applicable tolerances shown in table 2.

25. *Construction.*—Construction shall be such as to provide for smooth adjustment of the sine bar or sine plate and if provided with clamping means, for its rigidity when clamped in position above the working surface of the base. In the case of hinged fixtures the diameter of the pivot cylinder may differ from that of the cylinder at the free end.

26. *Material.*—The bases of sine bar and sine plate fixtures shall be seasoned cast iron or tool steel hardened, drawn and seasoned. (See par. 7a and 7b.) The material of the bar or plate shall be tool steel, hardened, drawn, and seasoned.

27. *Hardness.*—Cast iron bases of sine bar and sine plate fixtures shall have a hardness of 180–220 Brinell or equivalent surface hardness; steel bases shall have a hardness of Rockwell C60–65 or equivalent surface hardness. Hardness of bars and buttons and of plates and cylinders shall be as specified respectively for sine bars (par. 15) and sine blocks and plates (par. 21).

28. *Accuracy.*

28a. *Sine bars and sine plates.*—Accuracy requirements for sine bars of sine bar fixtures and for sine plates of sine plate fixtures shall be as specified in paragraphs 16 and 22 and tables 1 and 2. Additionally, for any operating setting of the complete fixture, including clamped settings, parallelism of button or cylinder axes to the working surface of the base shall be maintained within the limits specified in column 4 of tables 1 and 2.

28b. *Bases.*—Reference surfaces of bases of sine bar and sine plate fixtures shall be scraped, ground, or lapped flat and parallel within the applicable tolerances specified in column 2 of tables 1 and 2, for commercial and laboratory classifications, respectively. Specified tolerances apply to all areas to within $\frac{1}{16}$ in. from edges of finished surfaces.

METHODS OF TEST

29. *Bar, block, and plate tolerances.*

29a. *Flatness of working surfaces* of sine bars, blocks and plates is determined by means of an optical flat (where applicable), or by other suitable means, such as a precision reference surface and precision indicator.

29b. *Squareness of working surface to side faces* of the bar, block, or plate shall be tested by means of a cylindrical square, gage blocks, and surface plate, or by means of an angle iron of suitable accuracy, indicator, and surface plate, or by equivalent means.

29c. *Parallelism of working surfaces* shall be tested by means of a precision flat and precision indicator, or by equivalent means.

30. *Diameter, roundness, and taper of buttons and cylinders* shall be determined at 68° F by means of a measuring machine or a vertical or horizontal comparator of suitable amplification using gage blocks of suitable accuracy and with a 1-pound measuring load. An additional test for out-of-roundness due to lobular shape of button or cylinder section shall be made with a multiple contact anvil such as a V-block. In making the above measurements, the error should be not greater than 20% of the tolerance specified for the part being measured. Equivalent methods may be used.

31. *Alinement of buttons and cylinders.*—Parallelism of button and cylinder axes with each other and with upper face of the bar, block, or plate (and with lower face if a reference surface) shall be tested by means of a precision flat and precision indicator, or by equivalent means.

32. *Axial spacing of buttons and cylinders* shall be determined at 68° F. by means specified in paragraph 30, or by equivalent means.

33. *Flatness and bearing area of fixture bases.*—(a) Bases shall be tested for flatness of surface with an indicator-mounted three-point comparator checked against a reference surface, or equivalent means, or by means of an optical flat if surface finish permits (b) on cast iron plates, bearing area shall be determined by means of coating the surface with prussian blue or other suitable material, rubbing with another flat plate to reveal bearing areas, placing on the surface a glass plate ruled into small squares of equal area and recording the proportion of each small square occupied by high spots as well as the number of spots per square inch, or by a method of comparable accuracy.

34. *Alinement of sine bars and sine plates on fixtures* shall be tested in each extreme position and in at least one intermediate position, for parallelism of button axes to working surface of base by means of a precision indicator, or by equivalent means.

PACKING

35. Each sine bar, block, plate or fixture shall be supplied in a suitable, protective case or box, and as a protection against climatic conditions, shall be coated with a suitable noncorrosive oil or grease, and be securely wrapped in waxed paper or its equivalent.

MARKING

36. *Size and classification.*—Each sine bar, sine block or plate, sine bar fixture, and sine plate fixture, shall have its nominal size and classification designation (commercial or laboratory) legibly and permanently marked upon it in characters not less than 1/16-in. high.

37. *Manufacturer's name or trade mark.*—Each sine bar, sine block or plate, sine bar fixture, and sine plate fixture, shall have legibly and permanently marked upon it in characters not less than 1/16-in. high, the manufacturer's name or trade mark.

38. *Identification.*—In order to provide purchasers with a ready means of identifying sine bars, blocks, plates, and fixtures complying with this standard, it is recommended that each such device so complying, be marked "CS 141–47" in characters not less than 1/16-in. high.

39. It is further recommended that catalog descriptions, sales literature and slips accompanying sine bars, blocks, plates, and fixtures complying with this standard should incorporate the following statement:

> This sine bar (sine block, sine plate, sine bar fixture, sine plate fixture) complies with all the applicable requirements of Commercial Standard CS 141–47, as issued by the National Bureau of Standards of the United States Department of Commerce.

EFFECTIVE DATE

40. This standard becomes effective as a voluntary standard of the trade from August 15, 1947.

STANDING COMMITTEE

The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

D. R. Miller, *Chairman*

Manufacturers:

Frank Davison, Johansson Division, Ford Motor Co., Ypsilanti, Mich.
W. H. Gourlie, The Sheffield Corporation, 210 Capitol National Bank Bldg., Hartford 3. Conn.
J. A. Harrington, The DoAll Co., Savage, Minn.
Paul V. Miller, Small Tool & Gage Division, The Taft-Peirce Mfg. Co., Woonsocket, R. I.

Users:

L. W. Dwyer, Gage Section, Watervliet Arsenal, Watervliet, N. Y.
Merrill S. Hugo, P. O. Box 273, Mountain View, Calif.
W. H. Korff, Lockheed Aircraft Corp., Burbank, Calif.
Representing National Aircraft Standards Committee.
W. H. Smila, Plymouth Division, Chrysler Corp., 6334 Lynch Road, Detroit 31, Mich.
R. L. Wilhite, Production Engineering Section, General Motors Corp., 3044 W. Grand Blvd., Detroit 2, Mich.

Testing Laboratories:

D. R. Miller, Metrology Division, National Bureau of Standards, Washington, 25 D. C.
Dr. T. Smith Taylor, United States Testing Co., Inc., 1415 Park Ave., Hoboken, N. J.

HISTORY OF PROJECT

The War Production Board, on September 30, 1943, requested the cooperation of the National Bureau of Standards in the establishment of commercial standards for precision hand tools falling in several categories, one of these being tool room specialties. A preliminary manufacturers' conference in New York City, on December 15, 1943, reviewed a preliminary draft and directed that related groups of the items covered by this draft be submitted for comment by the manufacturers directly concerned.

Further development in accordance with the directions of the conference was continued by correspondence. Agreeable to the suggestion of the industry committee chairman, a separate draft of a proposed commercial standard for sine bars, blocks, plates, and fixtures was prepared on the basis of recommendations from leading manufacturers.

This draft was circulated on August 10, 1945, to manufacturers and representative user, distributor, and testing organizations for comment. Following adjustment of the draft in the light of that comment, the recommended commercial standard was circulated on January 28, 1946, to the trade for written acceptance.

Upon receipt of requisite acceptances in writing from the trade, including manufacturers representing a satisfactory majority by volume of production, announcement was issued on February 14, 1947, that the standard would become effective for new production from August 15, 1947.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date _____

Division of Trade Standards,
National Bureau of Standards,
Washington 25, D. C.

Gentlemen:

We believe that the Commercial Standard CS141–47 constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production [1] distribution [1] purchase [1] testing [1]

of sine bars, blocks, plates, and fixtures.

We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer _____
(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer _____

Organization _____
(Fill in exactly as it should be listed)

Street address _____

City, zone, and State _____

[1] Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General Support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

46. The organizations listed below have individually accepted this standard for use as far as practicable in the production, distribution, testing, or purchase of sine bars, blocks, plates, and fixtures. In accepting the standard they reserved the right to depart therefrom as they individually deem advisable. It is expected that articles which actually comply with the requirements of this standard in all respects will be regularly identified or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

ASSOCIATIONS
(General Support)

American Association of Engineers, Chicago, Ill.

FIRMS

A. B. C. Products, Inc., West Los Angeles, Calif.
Abrasive Machine Tool Co., East Providence, R. I.
Adams Co., The, Dubuque, Iowa.
Addressograph Multigraph Corp., The, Cleveland, Ohio.
Adrian Engineering & Manufacturing Co., Detroit, Mich.
Advanced Tool & Design Co., Philadelphia, Pa.
Aeroquip Corp., Jackson, Mich.
Agerstrand Corp., Muskegon, Mich.
Air Associates, Inc., Teterboro, N. J.
Ajax Iron Works, Corry, Pa.
Allen Gauge & Tool Co., Pittsburgh, Pa.
Alliance Manufacturing Co., Alliance, Ohio.
Allis-Chalmers Manufacturing Co., Milwaukee, Wis., and West Allis, Wis.
Altens Foundry & Machine Works, Lancaster, Ohio.
Aluminum Industries, Inc., Cincinnati, Ohio.
American Saw Mill Machinery Co., Hackettstown, N. J.
Angle Computer Co., The, Glendale, Calif.
Armour Research Foundation, Chicago, Ill.
Atlas Car & Manufacturing Co., The, Cleveland, Ohio.
Automatic Products Co., Milwaukee, Wis.
Automatic Transportation Co., Chicago, Ill.
Barco Scraping, Cleveland, Ohio.
Bauer Bros. Co., The, Springfield, Ohio.
Bausch & Lomb Optical Co., Rochester, N. Y.
Bell Aircraft Corp., Buffalo, N. Y.
Bell Telephone Laboratories, Inc., New York, N. Y.
Bendix Aviation Corp., Scintilla Magneto Division, Sidney, N. Y.
Berger Engineering Works, Inc., Seattle, Wash.
Black & Decker Manufacturing Co., The, Towson, Md.
Bodine Corp., The, Bridgeport, Conn.
Bower Roller Bearing Co., Detroit, Mich.
Bowser, Inc., Gear Division, Chelsea, Mich.
Bowser Morner Testing Laboratories, Dayton, Ohio.
Boyd Tool Co., Royal Oak, Mich.
Brady, Inc., F. A., New York, N. Y.
Bramson Publishing Co., Detroit, Mich.
Brown & Sharpe Manufacturing Co., Providence, R. I.
Buerk Tool Works, Buffalo, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Buffalo, University of, Buffalo, N. Y.
Bunell Machine & Tool Co., The, Cleveland, Ohio.
Bushey & Sons, Inc., Ira S., Brooklyn, N. Y.
California Institute of Technology, Pasadena, Calif.
California, University of, Berkeley, Calif.
Carboloy Co., Inc., Detroit, Mich.
Carey-McFall Co., Philadelphia, Pa.
Catholic University of America, The, Washington, D. C.
Cedar Rapids Engineering Co., Cedar Rapids, Iowa.
Cessna Aircraft Co., Wichita, Kans.
Chicago Rivet & Machine Co., Bellwood, Ill.
Chrysler Corp., Dodge Main Plant #4, Detroit, Mich.
Chrysler Corp., Plymouth Plant, Detroit, Mich.
City Engineering Co., The, Dayton, Ohio.
Clark Co., Robert H., Beverly Hill., Calif.
Clearview Equipment & Manufacturing Co., St. Louis, Mo.
Cleveland Pneumatic Tool Co., The, Cleveland, Ohio.
Cleveland Worm & Gear Co., Cleveland, Ohio.
Clyde Iron Works, Inc., Duluth, Minn.
Colt's Patent Fire Arms Manufacturing Co., Hartford, Conn.
Columbia University, Mechanical Engineering Department, New York, N. Y.
Consolidated Sewing Machine & Supply Co., Inc., New York, N. Y.
Consolidated Vultee Aircraft Corp., San Diego, Calif.
Consolidated Vultee Aircraft Corp., Stinson Division, Wayne, Mich.
Cornell University, College of Engineering, Ithaca, N. Y.
Conner Tool & Cutter Co., Detroit, Mich.
Covel Manufacturing Co., Benton Harbor, Mich.
Crafts Co., Inc., Arthur A., Boston, Mass.
Curtiss-Wright Corp., Curtiss Propeller Division, Caldwell, N. J.
Darling Valve & Manufacturing Co., Williamsport, Pa.
Davenport Besler Corp., Davenport, Iowa.
Dearborn Gage Co., Dearborn, Mich.
Deere & Co., Moline, Ill.
Deere Dubuque Tractor Co., John, Dubuque, Iowa.
Detroit Testing Machine Co., Detroit, Mich.
Detroit Universal Duplicator Co., Detroit, Mich.
DoAll Co., The, Savage, Minn.
Douglas Aircraft Co., Inc., Santa Monica, Calif., and El Segundo, Calif.
Eastern Precision Gage Co., Elizabeth, N. J.
Eastman Kodak Co., Hawk-Eye Works, Rochester, N. Y.
Eitzen Co., Louis C., New York, N. Y.
El Paso Testing Laboratories, El Paso, Tex.
Elco Tool & Screw Corp., Rockford, Ill.
Electric Sprayit Co., Sheboygan, Wis.
Electrical Engineers Equipment Co., Melrose Park, Ill.
Elgin National Watch Co., Sapphire Products Division, Aurora, Ill.
Ex-Cell-O Corp., Detroit, Mich.
Fairbanks Morse & Co., Beloit, Wis.
Fairchild Aircraft Corp., Hagerstown, Md.
Fairchild Engine & Airplane Corp., Ranger Aircraft Engines Division, Long Island, N. Y.
Falk Corp., The, Milwaukee, Wis.
Farquhar Co., A. B., York, Pa.
Fawick Airflex Co., Inc., Cleveland, Ohio.

Federal Products Corp., Providence, R. I.
Fellows Gear Shaper Co., The, Springfield, Vt.
Felt & Tarrant Manufacturing Co., Chicago, Ill.
Ferro Machine & Foundry Co., The, Cleveland, Ohio. (General support).
Fitchburg Engineering Corp., Fitchburg, Mass.
Fitzsimons Manufacturing Co., Detroit, Mich.
Fletcher, J. C., San Francisco, Calif.
Gardner-Denver Co., Denver, Colo.
Genaflash Co., Albany, N. Y.
General Electric Co., Schenectady, N. Y.
General Floorcraft, Inc., New York, N. Y.
General Machine Works, York, Pa.
General Machinery Corp., Hamilton, Ohio.
General Motors Corp., Cadillac Motor Car Division, Detroit, Mich.
General Motors Corp., Rochester Products Division, Rochester, N. Y.
General Motors Corp., AC Spark Plug Division, Flint, Mich. (General support).
General Motors Corp., Delco Products Division, Dayton, Ohio.
Geometric Tool Co., The, New Haven, Conn.
Georgia School of Technology, Atlanta, Ga.
Glenzer Co., Inc., The J. C., Detroit, Mich.
Globe Aircraft Corp., Ft. Worth, Tex.
Gourlie Co., W. H., Hartford, Conn.
Greaves Machine Tool Co., Cincinnati, Ohio.
Grumman Aircraft Engineering Corp., Bethpage, N. Y.
Gulf Research & Development Co., Pittsburgh, Pa.
Gurley, W. & L. E., Troy, N. Y.
Hale, George A., St. Louis, Mo.
Hamilton Gages, Inc., Hamilton, Ohio.
Hamilton Tool Co., The, Hamilton, Ohio.
Hart Brothers Machine Co., Clarksburg, W. Va.
Harvard University, Cambridge, Mass.
Hauselmann Engineering Corp., Denver, Colo.
Haynes Stellite Co., Kokomo, Ind.
Hedstrom Corp., Oscar W., Chicago, Ill.
Hendey Machine Co., The, Torrington, Conn.
Herkimer Tool & Model Works, Inc., Herkimer, N. Y.
Heyman Manufacturing Co., Kenilworth, N. J.
Hill Acme Co., The, Cleveland, Ohio.
Hoover Ball & Bearing Co., Ann Arbor, Mich.
Houdaille Hershey Corp., Houde Engineering Division, Buffalo, N. Y.
Hughes Tool Co., Houston, Tex.
Idaho, University of, Moscow, Idaho.
Illinois Tool Works, Chicago, Ill.
Index Machine & Tool Co., Jackson, Mich.
Inferno Co., The, Shreveport, La.
International Business Machine Corp., Endicott, N. Y.
International Derrick & Equipment Co., Columbus, Ohio.
International Totalizer Co., San Mateo, Calif.
Interstate Engineering Corp., El Segundo, Calif.
Ironton Engine Co., The, Ironton, Ohio.
Jansson Gage Co., Detroit, Mich.
Johnson Automatics Manufacturing Co., Providence, R. I.
Johnson Co., W. E., Pequannock, N. J.
Johnson Claflin Corp., Marlboro, Mass.
Johnson Gage Co., Bloomfield, Conn.
Johnson Motors, Waukegan, Ill.
Johnson Tool & Engineering, Inc., Dayton, Ohio.
Jones & Lamson Machine Co., Springfield, Vt.
Joyce Machine Co., The, Hatboro, Pa.
Kaiser Co., Inc., Portland Yard, Portland, Oreg.
Kaydon Engineering Corp., Muskegon, Mich.
Kearney & Trecker Corp., Milwaukee, Wis.
Kellett Aircraft Corp., Upper Darby, Pa.
Kellner Tool & Machine Co., Detroit, Mich.
Kennedy Van Saun Manufacturing & Engineering Corp., Danville, Pa.
King Machine Tool Co., The, Cincinnati, Ohio.
King Seeley Corp., Ann Arbor, Mich.
Krueger & Co., H. R., Detroit, Mich.
Landis Machine Co., Waynesboro, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Lima Locomotive Works, Inc., Lima, Ohio.
Lincoln Park Industries, Inc., Lincoln Park, Mich.
Link-Belt Co., Chicago, Ill.
Lockheed Aircraft Corp., Burbank, Calif.
Lyon Metal Products, Inc., Aurora, Ill.
Mack Manufacturing Corp., Allentown, Pa.
Maenick Co., Tulsa, Okla.
Martin Co., Glenn L., Baltimore, Md.
Masters, Inc., Irvin W., Los Angeles, Calif
Matthews & Co., Jas. H., Pittsburgh, Pa.
Mattison Machine Works, Rockford, Ill.
McCrosky Tool Corp., Meadville, Pa.
McKay Co., The, Pittsburgh, Pa.
Measuregraph Co., The, St. Louis, Mo.
Meisel Press Manufacturing Co., Boston, Mass.
Menasco Manufacturing Co., Burbank, Calif.
Merz Engineering Co., Indianapolis, Ind.
Metrical Laboratories, Inc., Ann Arbor, Mich.
Metro Tool & Gage Co., Chicago, Ill.
Michigan College of Mining & Technology, Houghton, Mich.
Michigan, University of, College of Engineering, Ann Arbor, Mich.
Midwestern Tool Co., Chicago, Ill.
Mill River Tool Co., Springfield, Mass.
Mine & Smelter Supply Co., The, Denver, Colo.
Minneapolis-Moline Power Implement Co., Minneapolis, Minn.
Minnesota, University of, Minneapolis, Minn.
Modern-Bond Corp., Wilmington, Del.
Moore Special Tool Co., Inc., Bridgeport, Conn.
Morey Machinery Co., Inc., Astoria, L. I., N. Y.
Morley-Murphy Co., Green Bay, Wis.
Muenz Co., O. A., Newark, N. J.
Napoleon Products Co., The, Napoleon, Ohio.
Nash Co., J. M., Nash-Zempel Tools Division, Milwaukee, Wis.
National Acme Co., The, Cleveland, Ohio.
National Cash Register Co., The, Dayton, Ohio
National Die Casting Co., Chicago, Ill.
National Supply Co., The, Superior Engine Division, Springfield, Ohio.
National Twist Drill & Tool Co., Rochester, Mich.
New Britain-Gridley Machine Co., The, New Britain, Conn.
New Paris Gage & Tool Co., Inc., New Paris, Ohio.
New York Air Brake Co., The, Watertown, N. Y.
Newark College of Engineering, Newark, N. J.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.
Norris Tool & Mach. Co., Philadelphia, Pa.
Northeast Tool & Die Works, Inc., Kansas City, Mo.
Northrop Aircraft, Inc., Hawthorne, Calif.
Norton Co., Machine Division, Worcester, Mass.
Novo Engine Co., Lansing, Mich.
Oklahoma A. & M. College, Civil Engineering Department, Stillwater, Okla.
Oloesson Tool & Die Co., Lansing, Mich.
Omar Tool & Machine Co., St. Louis, Mo.
Ordnance Gauge Co., Philadelphia, Pa.
Oregon State College, Corvallis, Oreg.
Peck, Stow & Wilcox Co., The, Southington, Conn.
Penn General Supply Co., Pittsburgh, Pa.
Pennsylvania Tool & Manufacturing Co., York, Pa.
Pfiffner Machine Co., St. Louis, Mo.
Pheoll Manufacturing Co., Chicago, Ill.
Pioneer Engineering & Manufacturing Co., Detroit, Mich.
Pioneer Pump & Manufacturing Co., Detroit, Mich.
Pipe Machinery Co., The, Cleveland, Ohio.
Pollak Manufacturing Co., Arlington, N. J.
Portage Machine Co., The, Akron, Ohio.
Portman Machine Tool Co., New Rochelle, N. Y.
Pratt & Whitney Aircraft Corp., East Hartford, Conn.
Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn.
Precise Tool & Manufacturing Co., Farmington, Mich.
Precision Tool & Manufacturing Co., Syracuse, N. Y.
Production Engineering Co., Berkeley, Calif.
Quality Tool & Die Co., Inc., Indianapolis, Ind.
Radio Corporation of America, RCA Victor Division, Camden, N. J.
Rayl Co., The, Detroit, Mich.
Realty & Industrial Corp., Roller-Smith Division, Bethlehem, Pa.
Redmond Co., Inc., Owosso, Mich.
Reed Roller Bit Co., Houston, Tex.
Reid Brothers Co., Inc., Beverly, Mass.
Rensselaer Polytechnic Institute, Troy, N. Y.
Robinson Laboratories, Louis G., Cincinnati, Ohio.

Rockwell Engineering Co., Chicago, Ill.
Rogers Machine Works, Inc., Alfred, N. Y.
Rollway Bearing Co., Inc., Syracuse, N. Y.
Ryan Aeronautical Co., San Diego, Calif.
Ryan Tool & Engineering Co., Detroit, Mich.
SKF Industries, Inc., Philadelphia, Pa.
Savage Tool Co., Savage, Minn.
Scherr Co., Inc., George, New York, N. Y.
Schrillo Aero Tool Engineering Co., Los Angeles, Calif.
Scripps Motor Co., Detroit, Mich.
Service Machine Co., Elizabeth, N. J.
Severance Tool Industries, Inc., Saginaw, Mich.
Sheffield Corp., The, Dayton, Ohio.
Simmons Machine Tool Corp., Albany, N. Y.
Simmons Manufacturing Co., The, Ashland, Ohio.
Skinner Engine Co., Erie, Pa.
Smalley-General Co., Bay City, Mich.
Smith-Emery Co., Los Angeles, Calif.
Solar Aircraft Co., San Diego, Calif.
Spiegel Sales Co., Detroit, Mich.
Squiers Gage Co., Berkeley, Mich.
Standard Aircraft Products, Inc., Dayton, Ohio.
Standard Gage Co., Inc., Poughkeepsie, N. Y.
Stanford University, Stanford University, Calif.
Studebaker Corp., South Bend, Ind.
Suman & Co., Inc., R. D., Richmond, Ind.
Swanson Tool & Machine Products, Inc., Erie, Pa.
Swarthmore College, Swarthmore, Pa.
Swedish Gage Co. of America, Detroit, Mich.
Taft-Peirce Manufacturing Co., The, Woonsocket, R. I.
Taylor Instrument Co's., Rochester, N. Y.
Tennessee, University of, Knoxville, Tenn.
Thomas Flexible Coupling Co., Warren, Pa.
Thompson Grinder Co., The, Springfield, Ohio.
Thompson Products, Inc., Cleveland, Ohio.
Tool Supply & Engineering Co., Dallas, Tex.
Townsend Manufacturing Co., The H. P., Hartford, Conn. (General support).
Tubular Micrometer Co., St. James, Minn.
Turner Bros., Inc., Ferndale, Mich.
Twin Disc Clutch Co., Racine, Wis.
Union Special Machine Co., Chicago, Ill.
United Industries, Detroit, Mich.
United States Testing Co., Inc., Hoboken, N. J. (General support).
United States Tool Co., Inc., Ampere (East Orange) N. J.
Universal Engineering Co., Frankenmuth, Mich.
Universal Tool Co., The, Dayton, Ohio.
Van Keuren Co., The, Watertown, Mass.
Van Norman Co., Springfield, Mass.
Van Trump Testing Laboratory, Chicago, Ill.
Vard, Inc., Pasadena, Calif.
Vickers, Inc., Detroit, Mich.
Wade Tool Co., The, Waltham, Mass.
Walker-Turner Co., Inc., Plainfield, N. J.
Warner Aircraft Corp., The, Detroit, Mich.
Warner & Swasey Co., The, Cleveland, Ohio.
Warren Industries, Warren, Mich.
Weatherhead Co., The, Cleveland, Ohio.
Wessor Manufacturing Co., Bridgeport, Conn.
Western Electric Co., Inc., Manufacturing Department, New York, N. Y.
Westinghouse Electric Corp., Mansfield, Ohio, and Pittsburgh, Pa.
Williams & Co., J. H., Buffalo, N. Y.
Willsea Works, Rochester, N. Y.
Wilson, K. R., Buffalo, N. Y.
Wolverine Motor Works, Inc., Bridgeport, Conn.
Wolverine Tool Co., Detroit, Mich.
York Corp., (Formerly York Ice Machinery Corp.), York, Pa.
Zehnder Engineering Service, Louisville, Ky.
Zenith Radio Corp., Chicago, Ill.

UNITED STATES GOVERNMENT

Agriculture, U. S. Department of, Washington, D. C.
Federal Prison Industries, Inc., Washington, D. C.
Ordnance Gage Laboratory, Palo Alto, Calif., and Los Angeles, Calif.
Frankford Arsenal, Gage Laboratory Division, Philadelphia, Pa.
Springfield Armory, Springfield, Mass.
Rock Island Arsenal, Rock Island, Ill.
Picatinny Arsenal, Dover, N. J.
War Department, Engineering Standards Section, Engineering Division, Dayton, Ohio.

COMMERCIAL STANDARDS

CS No. Item

0–40. Commercial standards and their value to business (third edition).
1–42. Clinical thermometers (third edition).
2–30. Mopsticks.
3–40. Stoddard solvent (third edition).
4–29. Staple porcelain (all-clay) plumbing fixtures.
5–46. Pipe nipples; brass, copper, steel and wrought-iron (second edition).
6–31. Wrought-iron pipe nipples (second edition). Superseded by CS5–46.
7–29. Standard weight malleable iron or steel screwed unions.
8–41. Gage blanks (third edition).
9–33. Builders' template hardware (second edition).
10–29. Brass pipe nipples. Superseded by CS5–46.
11–41. Moisture regains of cotton yarns (second edition).
12–40. Fuel oils (fifth edition).
13–44. Dress patterns (fourth edition).
14–43. Boys' button-on waists, shirts, junior and sport shirts (made from woven fabrics) (third edition).
15–46. Men's pajama sizes (made from woven fabrics) (third edition).
16–29. Wall paper.
17–42. Diamond core drill fittings (third edition).
18–29. Hickory golf shafts.
19–32. Foundry patterns of wood (second edition).
20–42. Staple vitreous china plumbing fixtures (third edition).
21–39. Interchangeable ground-glass joints, stopcocks, and stoppers (fourth edition).
22–40. Builders' hardware (nontemplate) (second edition).
23–30. Feldspar.
24–43. Screw threads and tap-drill sizes.

CS No. Item

25–30. Special screw threads. Superseded by CS24–43.
26–30. Aromatic red cedar closet lining.
27–36. Mirrors (second edition).
28–46. Cotton fabric tents, tarpaulins and covers (second edition).
29–31. Staple seats for water-closet bowls.
30–31. Colors for sanitary ware.
31–38. Wood shingles (fourth edition).
32–31. Cotton cloth for rubber and pyroxylin coating.
33–43. Knit underwear (exclusive of rayon) (second edition).
34–31. Bag, case, and strap leather.
35–47. Hardwood, plywood (third edition).
36–33. Fourdrinier wire cloth (second edition).
37–31. Steel bone plates and screws.
38–32. Hospital rubber sheeting.
39–37. Wool and part wool blankets (second edition). (Withdrawn as commercial standard, July 14, 1941).
40–32. Surgeons' rubber gloves.
41–32. Surgeon's latex gloves.
42–43. Structural fiber insulating board (third edition).
43–32. Grading of sulphonated oils.
44–32. Apple wraps.
45–45. Douglas fir plywood (sixth edition).
46–40. Hosiery lengths and sizes (third edition).
47–34. Marking of gold-filled and rolled-gold-plate articles other than watchcases.
48–40. Domestic burners for Pennsylvania anthracite (underfeed type) (second edition).
49–34. Chip board, laminated chip board and miscellaneous boards for bookbinding purposes.
50–34. Binders board for bookbinding and other purposes.

CS No. Item

51–35. Marking articles made of silver in combination with gold.
52–35. Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
53–35. Colors and finishes for cast stone.
54–35. Mattresses for hospitals.
55–35. Mattresses for institutions.
56–41. Oak flooring (second edition).
57–40. Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings (second edition).
58–36. Woven elastic fabrics for use in overalls (overall elastic webbing).
59–44. Textiles—testing and reporting (fourth edition).
60–36. Hardwood dimension lumber.
61–37. Wood-slat venetian blinds.
62–38. Colors for kitchen accessories.
63–38. Colors for bathroom accessories.
64–37. Walnut veneers.
65–43. Methods of analysis and of reporting fiber composition of textile products (second edition).
66–38. Marking of articles made wholly or in part of platinum.
67–38. Marking articles made of karat gold.
68–38. Liquid hypochlorite disinfectant, deodorant, and germicide.
69–38. Pine oil disinfectant.
70–41. Phenolic disinfectant (emulsifying type) (second edition) (published with CS71–41).
71–41. Phenolic disinfectant (soluble type) (second edition) (published with CS70–41).
72–38. Household insecticide (liquid spray type).
73–45. Old growth Douglas fir standard stock doors (third edition).
74–39. Solid hardwood wall paneling.
75–42. Automatic mechanical draft oil burners designed for domestic installations (second edition).
76–39. Hardwood interior trim and molding.
77–40. Sanitary cast-iron enameled ware.
78–40. Ground-and-polished lenses for sun glasses (second edition) (published with CS79–40).
79–40. Blown, drawn, and dropped lenses for sun glasses (second edition) (published with CS78–40).
80–41. Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
81–41. Adverse-weather lamps for vehicles (after market).
82–41. Inner-controlled spotlamps for vehicles (after market).
83–41. Clearance, marker, and identification lamps for vehicles (after market).
84–41. Electric tail lamps for vehicles (after market).
85–41. Electric license-plate lamps for vehicles (after market).
86–41. Electric stop lamps for vehicles (after market).
87–41. Red electric warning lanterns.
88–41. Liquid-burning flares.
89–40. Hardwood stair treads and risers.
90– . (Reserved for power shovels and cranes).
91–41. Factory-fitted Douglas fir entrance doors.
92–41. Cedar, cypress and redwood tank stock lumber.
93–41. Portable electric drills (exclusive of high frequency).

CS No. Item

94–41. Calking lead.
95–41. Lead pipe.
96–41. Lead traps and bends.
97–42. Electric supplementary driving and passing lamps for vehicles (after market).
98–42. Artists' oil paints.
99–42. Gas floor furnaces—gravity circulating type.
100–44. Porcelain-enameled steel utensils (second edition).
101–43. Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.
102– . (Reserved for Diesel and fuel-oil engines).
103–42. Cotton and rayon velour (jacquard and plain).
104–46. Warm-air furnaces equipped with vaporizing pot-type oil burners (second edition).
105–43. Mineral wool; loose granulated, or felted form, in low-temperature installations.
106–44. Boys' pajama sizes (woven fabrics) (second edition).
107–45. Commercial electric-refrigeration condensing units (second edition).
108–43. Treading automobile and truck tires.
109–44. Solid-fuel-burning forced-air furnaces.
110–43. Tire repairs—vulcanized (passenger, truck, and bus tires).
111–43. Earthenware (vitreous-glazed) plumbing fixtures.
112–43. Homogeneous fiber wallboard.
113–44. Oil-burning floor furnaces equipped with vaporizing pot-type burners.
114–43. Hospital sheeting for mattress protection.
115–44. Porcelain-enameled tanks for domestic use.
116–44. Bituminized-fibre drain and sewer pipe.
117–44. Mineral wool; blankets, blocks, insulating cement and pipe insulation for heated industrial equipment.
118–44. Marking of jewelry and novelties of silver.
(E)119–45.[1] Dial indicators (for linear measurements).
120–44. Standard stock ponderosa pine doors (second edition).
121–45. Women's slip sizes (woven fabrics).
122–45. Western hemlock plywood.
123–45. Grading of diamond powder.
(E)124–45.[1] Master disks.
125–45. Prefabricated homes.
126–45. Tank mounted air compressors.
127–45. Self-contained mechanically refrigerated drinking water coolers.
128–45. Men's sport shirt sizes—woven fabrics (other than those marked with regular neckband sizes).
129–46. Materials for safety wearing apparel.
130–46. Color materials for art education in schools.
131–46. Industrial mineral wool products, all types—testing and reporting.
132–46. Hardware cloth.
133–46. Woven wire netting.
134–46. Cast aluminum cooking utensils (metal composition).
135–46. Men's shirt sizes (exclusive of work shirts).
136–46. Blankets for hospitals (wool and wool and cotton).
137–46. Size measurements for men's and boys' shorts (woven fabrics).
138–47. Insect wire screening.
139–47. Work gloves.
140–47. Convectors; testing and rating.
141–47. Sine bars, blocks, plates and fixtures.

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice may secure copies of the above standards, while the supply lasts, by addressing the Division of Trade Standards, National Bureau of Standards, Washington 25, D. C.

[1] Where "(E)" precedes the CS number, it indicates an emergency commercial standard, drafted under war conditions with a view toward early revision.

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